REPORT NO. 88-R-05
AFPEA PROJECT NO. 88-P-116

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PERFORMANCE ORIENTED PACKAGING TESTING OF CNU-131/E STEEL MAVERICK MISSILE CONTAINER

HQ AFLC/DSTZ
AIR FORCE PACKAGING EVALUATION ACTIVITY
Wright-Patterson AFB OH 45433-5999

15 DECEMBER 1988

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ABSTRACT

Ogden Air Logistics Center (OO-ALC/MMWMM), Hill Air Force Base, Utah 84056-5609 requested assistance from the Air Force Packaging Evaluation Activity (AFPEA) to conduct Performance Oriented Packaging (POP) testing on a steel Maverick missile container (CNU-131/E).

The CNU-131/E container was fabricated by the Champion Company, Springfield, OH. The containers are environmentally sealed with a humidity indicator, desiccant port, and a pressure relief valve. The containers are designed to protect one AGM-65A/B/C/D all-up-round Maverick missile during world-wide shipment, storage, and handling. The containers will also be used for one missile without the guidance unit and for one missile without the guidance unit and the hydraulic actuation system.

The test plan used for the container was derived from United Nation (UN) Standard (Ref. ICAD 4.3), UN "Transport of Dangerous Goods", and DOD Hazardous Materials Packaging Test Plan.

Results of the tests conducted on the containers were acceptable. The containers did successfully pass the POP tests, as prescribed by the UN test criteria.

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INTRODUCTION

BACKGROUND: Ogden Air Logistics Center (OO-ALC/MMWMM), Hill Air Force Base, Utah 84056-5609 requested assistance from the Air Force Packaging Evaluation Activity (AFPEA) to conduct Performance Oriented Packaging (POP) testing on a steel Maverick missile container (CNU-131/E). The CNU-131/E container was fabricated by the Champion Company, Springfield OH.

PURPOSE: The purpose of this project was to determine whether the CNU-131/E container would not spill its contents, the AGM-65A/B/C/D all-up-round (AUR) Maverick missile. The container will also be used for shipment, storage, and handling of the missile less the guidance unit (GU) and the missile less both the GU and the hydraulic actuation system (HAS). The United Nations (UN) hazard code for the missile is class 1.1F. The packing code is Group II, with the packing method of E146.

TEST SPECIMEN

Two containers (serial numbers 1997 and 909-1-1) were sent from OO-ALC. The corners of the containers were numbered from the aft end (see figure 1).

DESIGN: The CNU-131/E is a controlled-breathing container with a pressure relief valve, a humidity indicator, and a desiccant port. The container is designed to limit the transmission of shocks to the missile at 30G or less when subjected to the conditions in AFSC Specification 1308. Thirty t-bolts attach the container cover to the container base. The missile is secured to the shock isolation system with a forward and aft clamp.

CONSTRUCTION: The container consists of a steel cover and base with an elastomeric shock mount system for shock isolation. A gasket provides a seal between the container base and the container cover.

TEST OUTLINE AND TEST EQUIPMENT

TEST PLAN: Tests were conducted in accordance with table I. Test methods and procedures used were as outlined in UN Standard (Ref. ICAD 4.3), UN "Transport of Dangerous Goods", and DOD Hazardous Materials Packaging Test Plan.

TEST CONTAINERS: The tests in this report were performed on CNU-131/E, serial number 1997. Only one container was used for testing since the tests were severe and it would be too costly to provide a new container for each drop.

TEST LOADS: All tests were conducted using the heaviest missile the container was designed for. The test load was an inert training missile weighing approximately 460 pounds. A container base loaded with 2500 pounds (three times the gross weight of a container with a light standard load) was also used for test number 2 to simulate stacked containers.

TEST SITES: Testing was conducted at AFPEA, HQ AFLC/DSTZ, Building 70, Area C, Wright-Patterson AFB OH. The equipment required for testing was a temperature chamber and a forklift truck.

TEST PROCEDURES AND RESULTS

UN DROP TEST

Test No. 1: At ambient temperature, the container was dropped flat on the bottom, side 2 (long side), the top, side 3 (short side), and top corner 3-4. The container shall not spill its contents.

Results: Visual inspection revealed that side 3 had deformed (see figure 2). The container was opened and the following damage was found: the missile had traveled inside the container sliding the rubber pad forward on the aft clamp (see figure 3) and abrading the container cover (see figure 4). Also, the forward end of the missile hit and deformed the container cover and base (see figures 5 and 6). However, the container did not spill its contents. Results of this test are acceptable.

UN STACKING TEST

Test No. 2: At ambient temperature, a superimposed load of 2500 pounds was placed on the container for 24 hours. The container shall not permanently deform.

Results: The container was dimensionally checked and no permanent deformation occurred during the stacking test. The results of this test are acceptable.

CONCLUSION

1. The container successfully passed the POP tests, as prescribed by the UN test criteria.

TABLE I.

AIR FORCE PACKAGING EVALUATION ACTIVITY
(Container Test Plan)

AFPEA PROJECT NUMBER: 88-P-116

CONTAINER SIZE (L x W x D)(INCHES) INTERIOR:	EXTERIOR:	WEIGHT (LBS) GROSS:	ITEM:	CUBE (CU. FT.)	QUANTITY	DATE
	105 x 26 x 28	830	460	44	2	15 Sep 88

ITEM NAME: AGM-65 Maverick Missile

MANUFACTURER: Champion Company

CONTAINER NAME: CNU-131/E (UN Tests)

CONTAINER COST:

PACK DESCRIPTION: Steel Container

CONDITIONING: As noted below.

TEST NO.	REF STD/SPEC AND TEST METHOD OR PROCEDURE NO'S	TEST TITLE AND PARAMETERS	CONTAINER ORIENTATION	INSTRU-MENTATION
1.	UN DROP TEST *(9.7.3)	Drop height 1.2m (3.94 ft) as required for Packaging Group II. The container shall not spill its contents. A different container may be used for each drop.	One each flat drop on the bottom, top, long side, short side and a corner. Total of 5 drops. Test with the heaviest AUR.	
2.	UN STACKING TEST (9.7.6)	Simulate stacking to a minimum height of 3m (9.84 ft) for 24 hours. There shall be no permanent deformation.**		

COMMENTS: * Figures in parenthesis refer to UN "Orange Book" requirements.
** The superimposed load test in MIL-STD-648 exceeds the UN stacking test.

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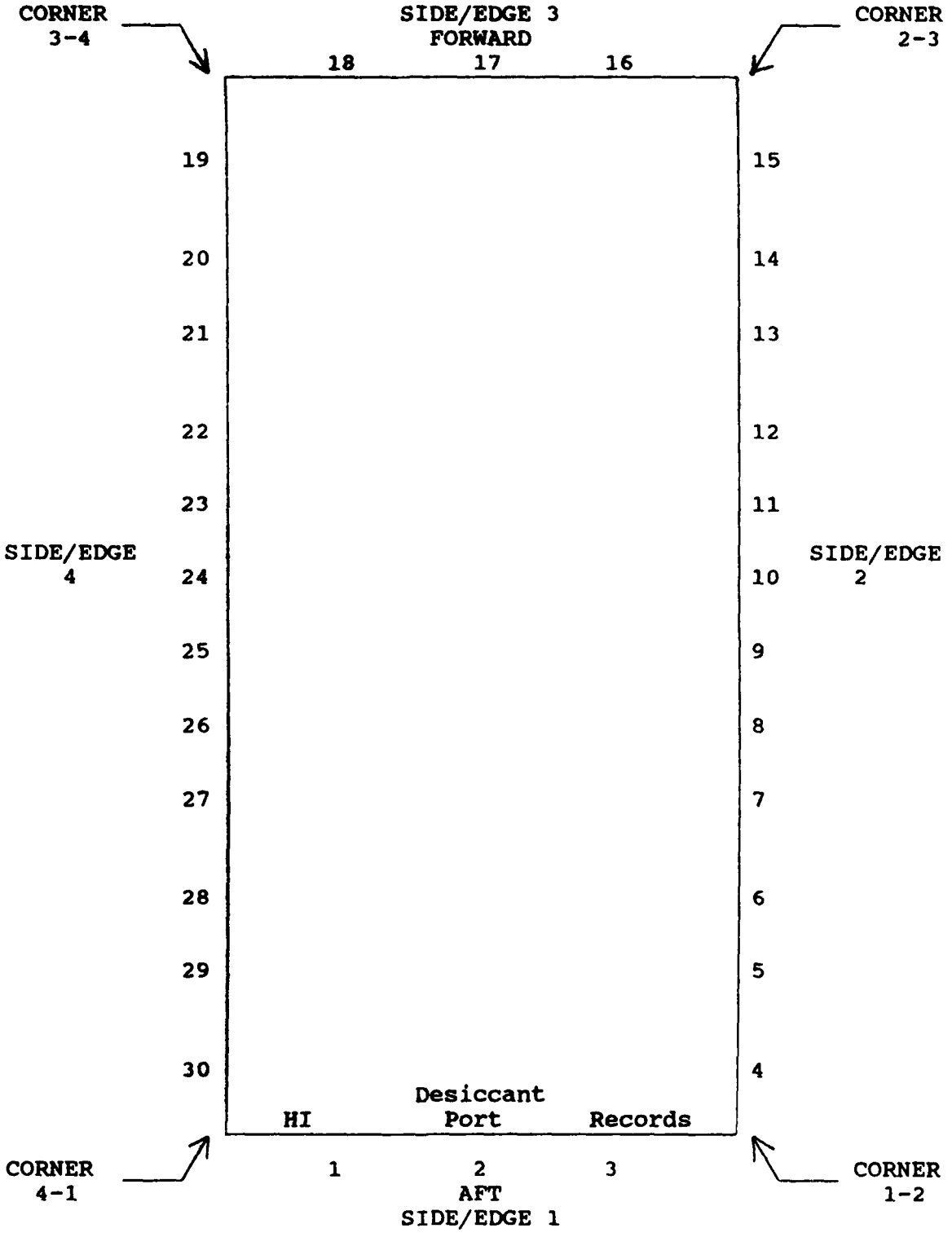

FIGURE 1. CONTAINER CONFIGURATION

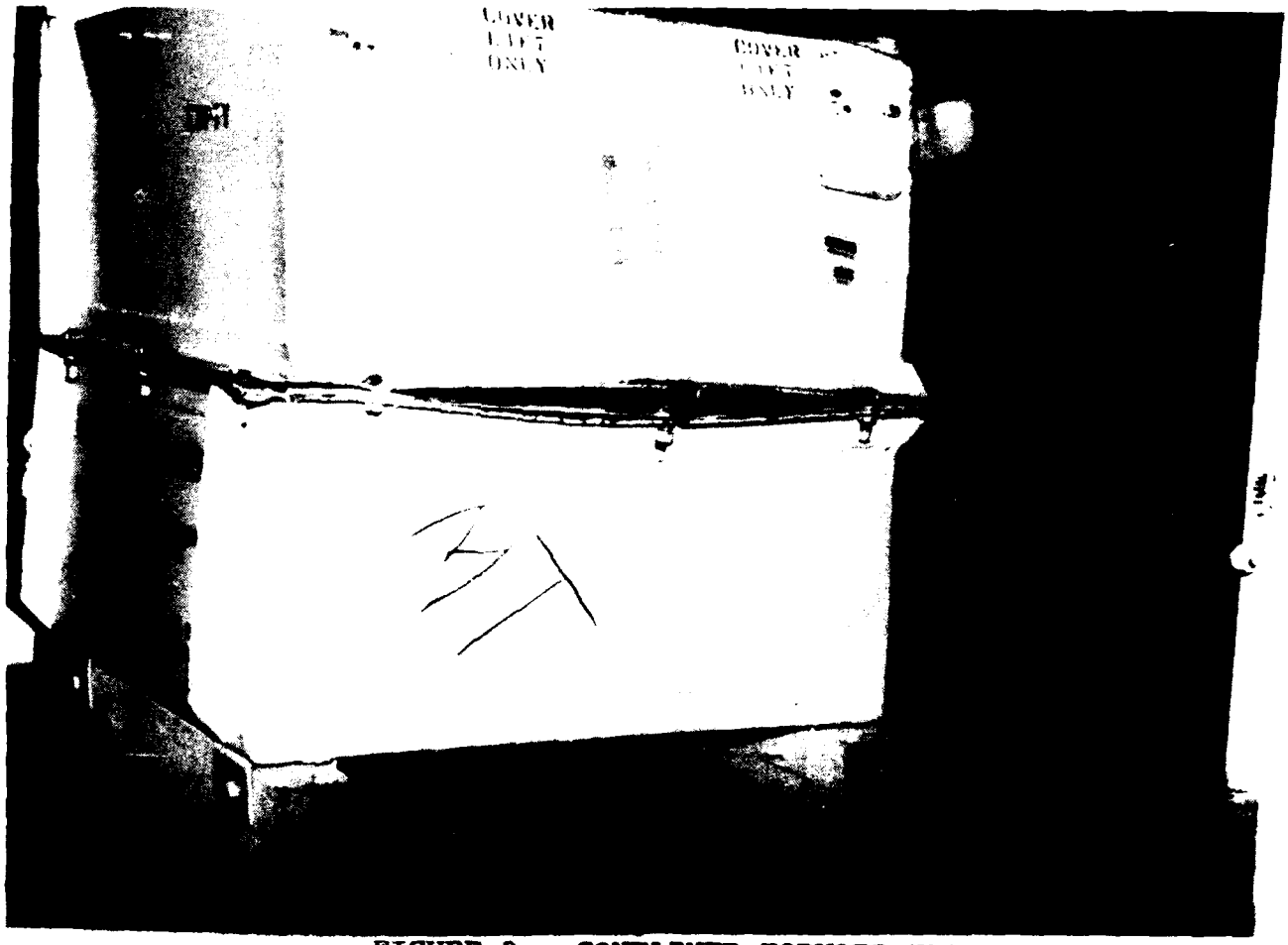

FIGURE 2. CONTAINER FORWARD END.

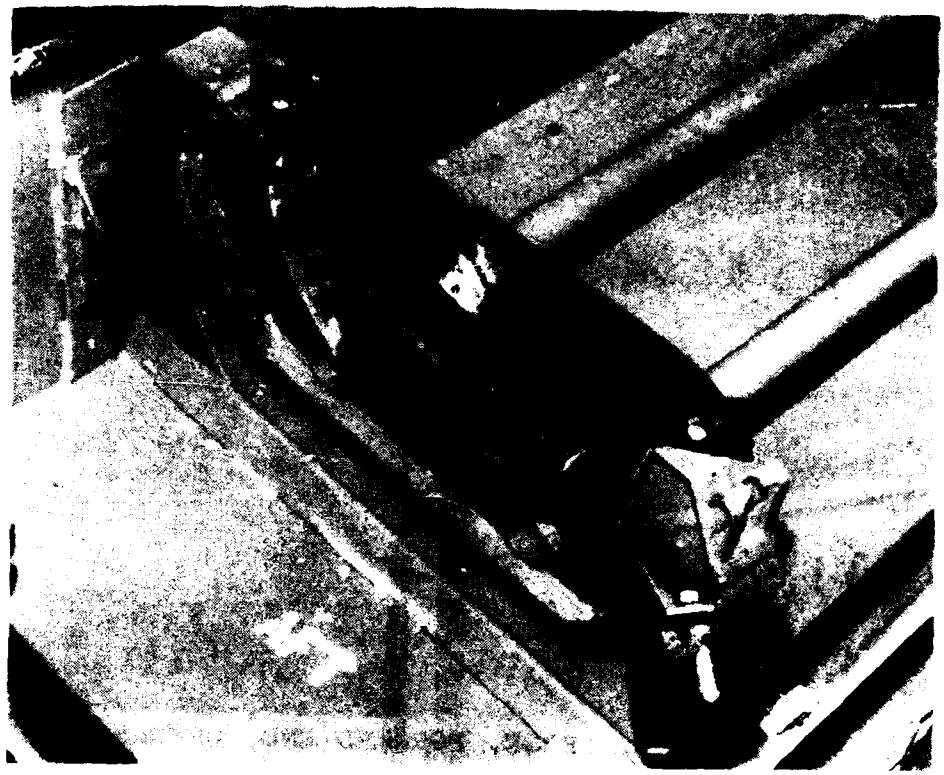

FIGURE 3. AFT END, RUBBER PAD.

FIGURE 4. COVER, AFT END, ABRASION.

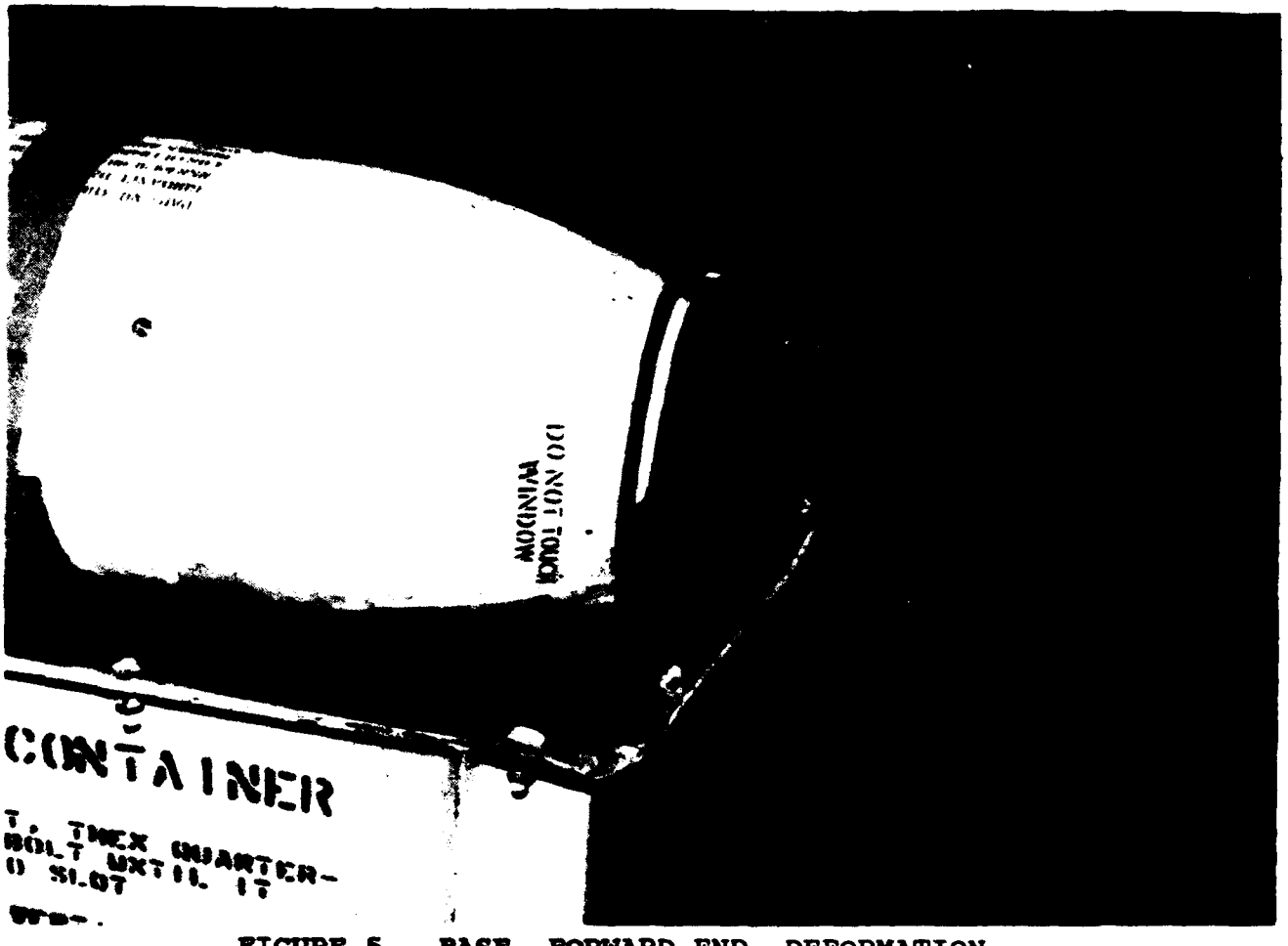

FIGURE 5. BASE, FORWARD END, DEFORMATION.

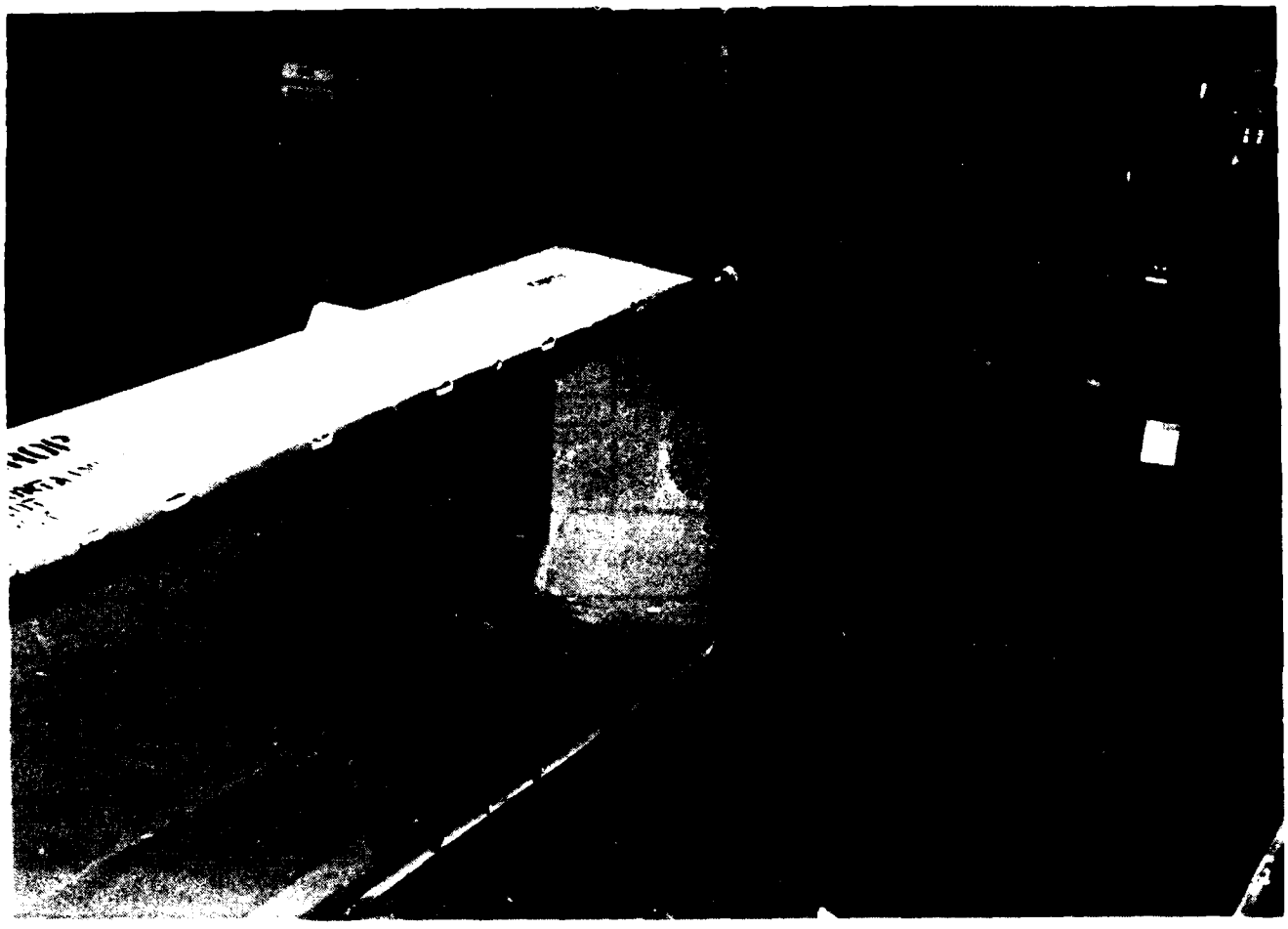

FIGURE 6. COVER, FORWARD END, DEFORMATION.

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19. ABSTRACT (Continue on reverse if necessary and identify by block number)

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19. (Continued)

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